6 May 1999

SPAWAR

Software Process Improvement at PMW 163

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Background

- The Backbone of the support provided by PMW 163 is the software it acquires
  - Cryptology systems
  - Signal detection systems
- Complex, operationally demanding applications
- We have to improve our software acquisition processes
  - Faster Better Cheaper

What Did We Do

- Partnered with the Software Program Managers Network (SPMN) to establish effective process.
- Anchor of process improvement was, and is, Effective Risk Management.
  - Conducted Frequent effective risk management training at all program levels.
  - Conducted Risk ID sessions at each major program support facility
  - Developed and implemented Risk Management Policy and Plans
  - Implemented Risk Radar across all programs
  - Assigned Risk officers

What Was Our Goal

- Change PMW 163 program environments from reactive to anticipatory
  - Remove Crisis Management from program environments
  - Maximize response time for risk mitigation
  - Allow managers to focus on what they have to do; Not which fire has to be put out.
  - Build an environment of trust where potential problems can get a thoughtful analysis

What Are We Doing Now

- Developed a PMW 163 variant of the SPMN 16 Point Plan™ as a roadmap for program software process improvement.
- Evaluate program processes to evaluate process improvement in each are
- Set aggressive, but achievable goals for all programs
  - 100 hour reliability within a year
  - All programs have an effectiveness score of 4 out of 5 in 12 of the 16 areas within 8 months
  - All programs will meet cost and schedule constraints within a year.

What Is The Prognosis

- All programs supported by PMW 163 are energized and committed to this program.
- Improvements in program performance is already becoming evident.
- Challenges have become evident and are being addressed in real time:
  - Cultural Obstacles
  - Funding
  - Resources
  - Training
- We will be premiere SPAWAR software acquisition organization within two years.

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PMW 163 Process Reengineering

PMW 163 16 Point Plan Implementation Strategy

- Evaluated Program Office acquisition strategy with SPMN in October 1997
  - Many strengths (technology, legacy, personnel)
  - Many issues to be resolved
    - Problem, rather than risk driven.
    - Schedule and cost pressure forced unacceptable process tradeoffs
    - Culture was can-do; Reality was optimism was compromising success
- As part of San Diego move implemented 3 point plan for software acquisition success

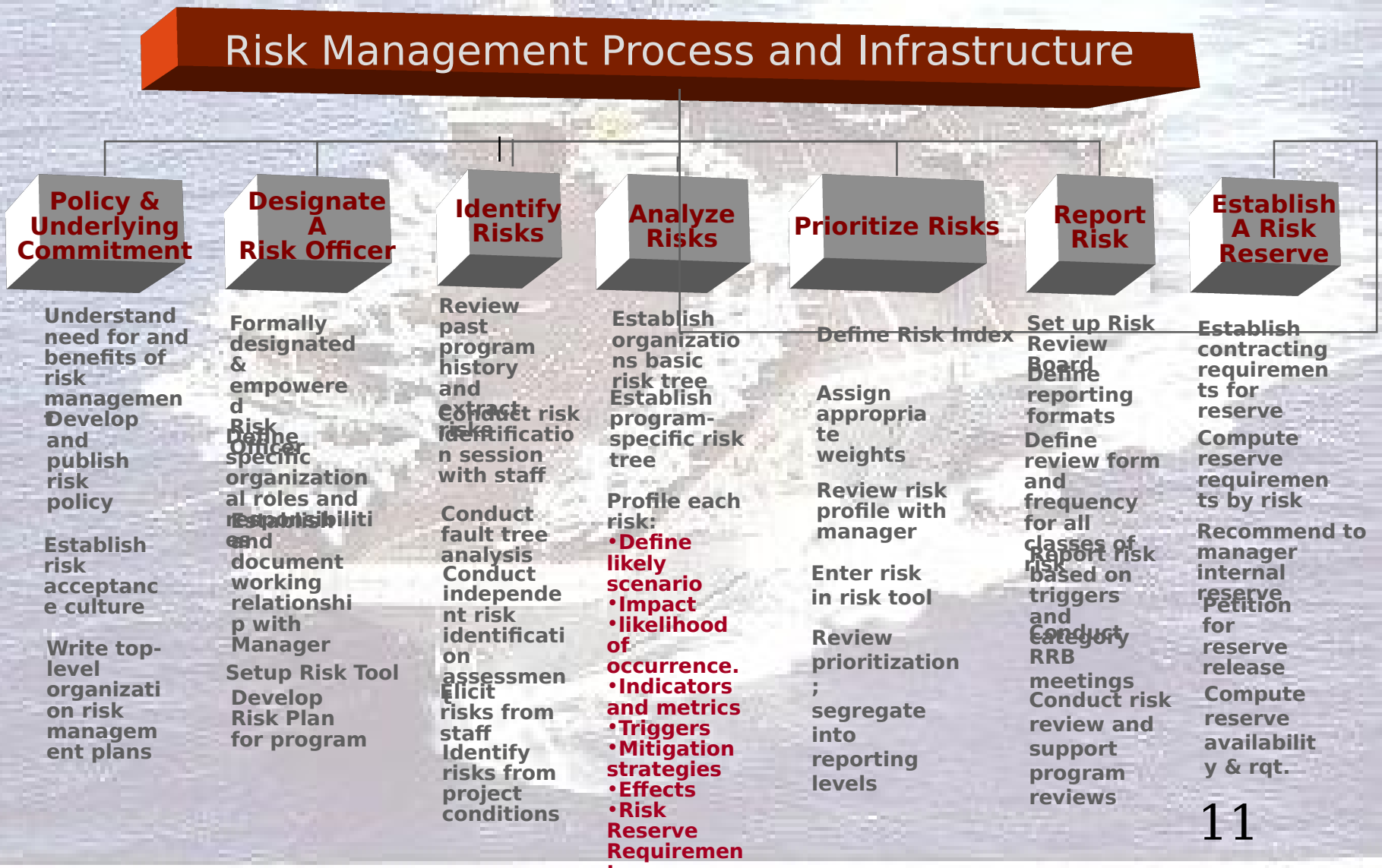
PMW 163 3 Point Plan

- Implement effective Risk Management as cornerstone of process improvement
- Develop, implement and enforce PMW 163 Best Practices
- Monitor and Enforce Process improvement against non-ambiguous set of goals

Implement effective Risk Management

- Used SPMN to train staff and suppliers in Risk Management
  - 2 hour executive overview
  - 1 day practice essentials
  - 2 ½ day “How To” Risk Officers Training
- Program Manager issued Risk Policy applicable to all programs
- Used SPMN to conduct Risk Identification sessions at each major program.
- Assigned Risk Officer at PMW and required assignment at each program organization

PMW 163 Risk Process


Risk Management Process and Infrastructure
Policy & Underlying Commitment
Designate A Risk Officer
Identify Risks
Analyze Risks
Prioritize Risks
Report Risk
Establish A Risk Reserve
Understand need for and benefits of risk management
Develop and publish risk policy
Establish risk acceptance culture
Write top-level organization risk management plans
Formally designated & empowered Risk Officer
Define specific organizational roles and responsibilities
Establish and document working relationship with Manager
Setup Risk Tool
Develop Risk Plan for program
Review past program history and extract risks
Conduct risk identification session with staff
Conduct fault tree analysis
Conduct independent risk identification assessment
Elicit risks from staff
Identify risks from project conditions
Establish organizations basic risk tree
Establish program-specific risk tree
Profile each risk:
•Define likely scenario
•Impact
•likelihood of occurrence.
•Indicators and metrics
•Triggers
•Mitigation strategies
•Effects
•Risk Reserve Requirement
Define Risk Index
Assign appropriate weights
Review risk profile with manager
Enter risk in risk tool
Review prioritization; segregate into reporting levels
Set up Risk Review Board
Define reporting formats
Define review form and frequency for all classes of risk
Report risk based on triggers and category
Conduct RRB meetings
Conduct risk review and support program reviews
Establish contracting requirements for reserve
Compute reserve requirements by risk
Recommend to manager internal reserve
Petition for reserve release
Compute reserve availability & rqt.

Where We Are

- Risk Process is in place and working
  - Cultural resistance remains in several areas
  - Contracting process precludes implementation of key areas (Risk Reserve)
  - Mentoring must be a continuous process
- We are moving into a cooperative environment with our suppliers to honestly report and address risk

Develop, implement and enforce PMW 163 Best Practices

- In parallel with Risk Management implementation developed PMW 163 Best Practices Manual
  - For software practices decided to pilot evolving SPMN 16 Point Plan™
    - 16 Points addressed our needs
    - Based on proven industry practice; not theory
    - Consistent with suppliers stated capability
  - Manual was developed and sent as requirement for all PMW 163 Program Managers To implement

Implementation Plan

- Require each supplier to implement practice or comparable alternative.
- Provide training in practice essentials and PMW 163 expectations
  - Senior Management
  - Program Managers
  - Suppliers
- Established, with SPMN assistance criteria for acceptable performance

Monitor and Enforce Process improvement

- Baseline Developers process against PMW 163 software acquisition Best Practices.
- Score level of process effectiveness.
- Identify, through interviews, areas of potential improvement.
- Setup subsequent assessments to update progress.

Basic Assessment Process

- Process is interview based; Developers respond to questions presented by interviewer.
- 388 questions, all weighted.
- Questions are structured such that it is difficult to smoke.
- Answer is rated on a 5 point scale.
- Observations are recorded as discussion progresses as notes.
- While scoring is subjective it is based on over 120 assessments.

Why is this assessment critical

- PMW 163 must improve software acquisition success
  - Cost Performance
  - Schedule Predictability
  - Product Quality
  - User Satisfaction
- Developers have been unable or reluctant to flow process change into projects.
- PMW 163 has grabbed the reigns; require SPMN 16 Point Plan™ on all projects.
- Backed up by Best Practices Manual
- Enforced by these assessments

Why Will Assessments Work

- Absolute project focus. Don't care about CMM rating, SWEP, Software Instruction or any other institutional artifact.
  - ***How does the project perform against the 16 POINT Plan™.***
- Conducted every 3 months. Not telling the developers how to do business, only making sure they do.
- Comparative scores evaluate improvement.
- Focus is improvement, not the score.
- Will establish short term urgency at developers; Don't want to be worse.

In Summary

- PMW 163 has committed, and is progressing well towards achieving Capt. Rodriguez's Goals
- SPMN partnership has been crucial to our success
- Simple is better than high tech or complex
- Continuous vigilance is essential